**Scientific Method, Lab Safety, and Metric Measurement Quiz**

*DO NOT write on this paper!*

1. A student notices that the evening sky is usually red. He wants to find out why. Which of the following would be the next step?

1. He publishes an article on sky conditions.
2. He starts to experiment to see how dust affects light rays.
3. He thinks that dust in the sky makes the sky red.
4. Other scientists confirm his experiments.

2. An educated guess that has not been proven, but is based on knowledge is called what?

1. a theory
2. an observation
3. an experiment
4. a hypothesis

3. A scientist testing the effects of a chemical on apple yield sprays an orchard with the chemical. A second orchard does not receive the chemical. In the fall, the number of apples harvested from each forest is counted. Which of the following is the dependent (responding) variable in the experiment?

1. the amount of chemical sprayed
2. the number of apples
3. the first orchard
4. the second orchard

4. In order for the apple tree experiment to be valid scientifically, both orchards must:

1. receive the same amount of sunlight
2. receive the same amount of water
3. have the same species of apple tree
4. all of these

5. The scientific method is a process for experimentation that is used to explore observations and answer questions. What is the first step in completing the scientific method?

1. project experimentation
2. hypothesis
3. problem
4. research

6. \_\_\_\_\_\_ can be measured with a graduated cylinder in milliliters or liters.

1. Density
2. Mass
3. Volume
4. Weight

7. As part of an experiment to measure decomposition rates of different materials, students put food scraps from the cafeteria in compost bin A and leaves and grass clippings in compost bin B for six weeks. Students in first period measured the temperature in bin A, and students in sixth period measured the temperature in bin B. What is the greatest error in the students’ experimental design?

1. There are too many uncontrolled variables in the experiment.
2. Temperature is the only dependent variable in the experiment.
3. The materials chosen decompose too rapidly.
4. The students put equal masses of materials in each bin.

8. A student hypothesizes that green algae will grow fastest when exposed to blue light. To test this hypothesis, the student should design an experiment with which independent variable?

1. Color of algae
2. Rate of algae growth
3. Color of light that algae are exposed to
4. Amount of time per day that algae are exposed to light



9. The diagram shows a setup for a plant investigation. Which variable is most likely being tested?

1. Hours of light exposure
2. Plant species
3. Soil volume
4. Soil pH

10. Students plan to use several rain gauges to compare average monthly rainfall in Lynchburg and Virginia Beach. Which of these variables should be manipulated?

1. Height of the gauge
2. Brand of the gauge
3. Size of the gauge
4. Location of the gauge



11. The data show the growth of two bean plants over several weeks using four different fertilizers. The experimental data would be more valid if which of the following variables was included in the experiment?

1. A fifth fertilizer was tested.
2. Only one plant was tested.
3. The plants were grown at variable temperatures.
4. **A control without fertilizer was included *for each plant. \_*

12. Jan consistently read the volume of liquids as shown. How would this practice impact her work?

1. Her measurements would lack precision.
2. Her measurements would be too high.
3. Her measurements would be too low for less dense liquids.
4. Her measurements would be very accurate.

13. Orchids were studied to determine if the amount of humidity affected the flowering of these plants. Which of these was the independent variable in this study?

1. The percentage of humidity\_
2. The amount watered
3. The length of time required for flowering
4. The number of flowers on each plant

14. When heating substances in a test tube, be sure the open end points toward

1. yourself.
2. no other person.
3. your teacher.
4. a classmate.

15. When smelling a liquid

1. inhale deeply.
2. use the fume hood.
3. waft it toward you.
4. pour it on the table.

16. You are heating a piece of glass and now want to pick it up. You should

1. use a rag or paper towels.
2. pick up the end that looks cooler.
3. use tongs.
4. pour cold water on it.

17. If you do not understand a direction or part of a lab procedure, you should

1. figure it out as you do the lab.
2. try several methods until something works.
3. ask the instructor before proceeding.
4. skip it and go on to the next part.

18. Long hair in the laboratory must be

1. cut short.
2. held away from the experiment with one hand.
3. always neatly groomed.
4. tied back or kept entirely out of the way with a hair band, hairpins, or other confining device.

19. A student is trying to determine which temperature produces the biggest tomatoes in his greenhouse. He divides the greenhouse in two and keeps one side at 30°C and the other at 40°C. At the end of the summer, he averages the mass of all the tomatoes produced on each side of the greenhouse. Which of the following is the dependent variable?

1. temperature
2. plant type
3. tomato mass
4. greenhouse location

20. Which tool would you use to measure the mass of an object?

1. triple beam balance
2. meter stick
3. graduated cylinder
4. calculator

21. How many milligrams are in a gram?

1. 10
2. 100
3. 1,000
4. 10,000